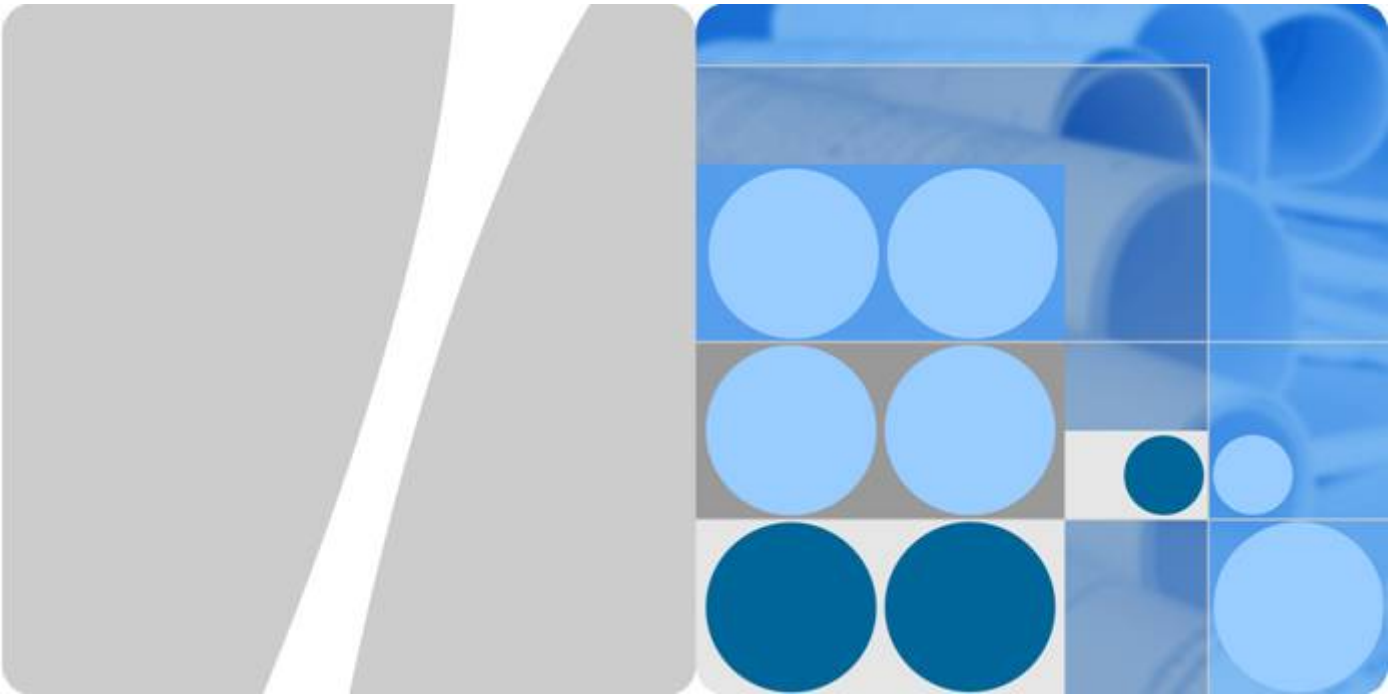

BBU3900

V301R008C00

Hardware Maintenance Guide

Issue 01

Date 2011-06-20

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About This Document

Purpose

This document describes the BBU3900 routine maintenance, which consists of the power supply and grounding system maintenance, cabinet maintenance, and power-on and power-off operations. This document also describes the procedures for replacing the boards and modules.

Product Version

The following table lists the product version related to this document.

Product Name	Product Version
BBU3900	V301R008C00

Intended Audience

This document is intended for:

- System engineers
- Site maintainers

Organization

1 Changes in the BBU3900 Hardware Maintenance Guide

This describes the changes in the *BBU3900 Hardware Maintenance Guide*.

2 Maintenance Items of the BBU

The maintenance items consist of the checking of fans, equipment surface, equipment cleanness, and LEDs.

3 Powering On and Powering Off the BBU

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This describes how to power on and power off the BBU. When powering on the BBU, you should check the status of the LEDs on the BBU. When powering off the BBU, you can perform normal power-off or emergency power-off operation based on the actual situations.

4 Replacing the BBU in the 19-Inch Cabinet

This chapter describes how to replace the BBU in a 19-inch cabinet, such as in an APM30 or TMC.

5 Replacing the Components in the OMB

This chapter describes how to replace the components in the OMB, such as the BBU, HEUA, AC/DC power equipment, DCDU-03B, and AC surge protection box.

6 Replacing the BBU Parts

When BBU3900 components are faulty, they need to be replaced as soon as possible. The components that can be replaced are the BBU3900, boards and modules of the BBU3900, and optical modules.

7 Replacing SLPU Parts

During the SLPU maintenance, the following parts of the SLPU can be replaced as required: the SLPU case and UELP.

Conventions

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
DANGER	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.
WARNING	Indicates a hazard with a medium or low level of risk, which if not avoided, could result in minor or moderate injury.
CAUTION	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
TIP	Indicates a tip that may help you solve a problem or save time.
NOTE	Provides additional information to emphasize or supplement important points of the main text.

General Conventions

The general conventions that may be found in this document are defined as follows.

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Convention	Description
Times New Roman	Normal paragraphs are in Times New Roman.
Boldface	Names of files, directories, folders, and users are in **boldface**. For example, log in as user **root**.
Italic	Book titles are in *italics*.
`Courier New`	Examples of information displayed on the screen are in Courier New.

Command Conventions

The command conventions that may be found in this document are defined as follows.

Convention	Description
Boldface	The keywords of a command line are in **boldface**.
Italic	Command arguments are in *italics*.
[ ]	Items (keywords or arguments) in brackets [ ] are optional.
{ x | y | ... }	Optional items are grouped in braces and separated by vertical bars. One item is selected.
[x | y | ...]	Optional items are grouped in brackets and separated by vertical bars. One item is selected or no item is selected.
{ x | y | ... }*	Optional items are grouped in braces and separated by vertical bars. A minimum of one item or a maximum of all items can be selected.
[x | y | ...]*	Optional items are grouped in brackets and separated by vertical bars. Several items or no item can be selected.

GUI Conventions

The GUI conventions that may be found in this document are defined as follows.

Convention	Description
Boldface	Buttons, menus, parameters, tabs, window, and dialog titles are in **boldface**. For example, click **OK**.
>	Multi-level menus are in **boldface** and separated by the ">" signs. For example, choose **File** > **Create** > **Folder**.

Keyboard Operations

The keyboard operations that may be found in this document are defined as follows.

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Format	Description
Key	Press the key. For example, press **Enter** and press **Tab**.
Key 1+**Key 2**	Press the keys concurrently. For example, pressing **Ctrl**+**Alt**+**A** means the three keys should be pressed concurrently.
Key 1, **Key 2**	Press the keys in turn. For example, pressing **Alt**, **A** means the two keys should be pressed in turn.

Mouse Operations

The mouse operations that may be found in this document are defined as follows.

Action	Description
Click	Select and release the primary mouse button without moving the pointer.
Double-click	Press the primary mouse button twice continuously and quickly without moving the pointer.
Drag	Press and hold the primary mouse button and move the pointer to a certain position.

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1 Changes in the BBU3900 Hardware Maintenance Guide

This describes the changes in the *BBU3900 Hardware Maintenance Guide*.

01 (2011-06-20)

This is the first commercial release.

Compared with issue draft A (2011-01-20) of V301R008C00, this issue does not include any new topics.

Compared with issue draft A (2011-01-20) of V301R008C00, this issue does not incorporate any changes.

Compared with issue draft A (2011-01-20) of V301R008C00, this issue does not exclude any topics.

Draft A(2011-01-20)

This is the draft A release.

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2 Maintenance Items of the BBU

The maintenance items consist of the checking of fans, equipment surface, equipment cleanness, and LEDs.

Maintenance Items of the Equipment

Table 2-1 lists the maintenance items associated with the BBU.

Table 2-1 Maintenance items associated with the BBU

Item	Interval	Operation Instructions	Reference Standard
Checking the fans	Weekly, monthly, or quarterly	Check the fans.	Alarms related to the fans are not present.
Checking the equipment surface	Monthly or quarterly	Check whether there are dents, cracks, holes, or corrosion on the surface of the equipment and whether the cabinet label is legible.	None.
Checking the equipment cleanness	Monthly or quarterly	Check whether the equipment is clean.	The surface of the equipment is clean and no dust is accumulated inside the cabinet.
Checking the LEDs	Monthly or quarterly	Check whether the equipment operates normally by observing the LEDs on the equipment.	For details about the status of the LEDs, refer to *BBU3900 Hardware Description*.

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3 Powering On and Powering Off the BBU

About This Chapter

This describes how to power on and power off the BBU. When powering on the BBU, you should check the status of the LEDs on the BBU. When powering off the BBU, you can perform normal power-off or emergency power-off operation based on the actual situations.

3.1 Powering On the BBU
Before powering on the BBU, set the power switch on the BBU to **ON** and determine the operation status of the BBU based on the status of the LEDs.

3.2 Powering Off the BBU
The BBU power-off is classified into normal power-off and emergency power-off.

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3.1 Powering On the BBU

Before powering on the BBU, set the power switch on the BBU to **ON** and determine the operation status of the BBU based on the status of the LEDs.

Prerequisite

- The hardware and cables of the BBU are installed.
- The voltage of the external input power ranges from -38.4 V DC to -57 V DC or +21.6 V DC to +29 V DC.

Procedure

Step 1 Power on the BBU by setting its power switch to **ON**.

Step 2 Check the status of the three LEDs on the BBU panel, namely **RUN**, **ALM**, and **ACT**, and then proceed with the subsequent operations based on the status of the LEDs.

If...	Then...
● The **RUN** LED is on for 1s and off for 1s, ● The **ALM** LED is off for 1s. ● The **ACT** LED is on.	The board operates normally. Go to **Step 3**.
● The **RUN** LED is on, ● The **ALM** LED is on, ● The **ACT** LED is off,	The board does not work properly. Rectify the faults in the following manner: ● Verify that the power cable is securely connected. ● Reset the board. ● Remove the board and check whether there are damaged pins. If there are damaged pins, replace the board. If there are no damaged pins, reinstall the board. Check the LEDs. If the states of the LEDs are normal, go to **Step 3**. If the states of the LEDs are not normal, contact Huawei Technical Support.

Step 3 View the status of the other LEDs on the BBU panel.

Step 4 Take corresponding actions based on the LED status.

If...	Then...
The BBU runs normally,	The power-on operation is complete.
The BBU is faulty,	Rectify the fault, and then go to **Step 1**.

----End

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3.2 Powering Off the BBU

The BBU power-off is classified into normal power-off and emergency power-off.

Procedure

Step 1 Choose normal power-off or emergency power-off based on the actual situation.

If...	Then...
The BBU is powered off in the case of an equipment swap or a foreseeable regional blackout,	Go to **Step 2** to perform the normal power-off.
The BBU incurs electric spark, smog, water immersion, and so on,	Go to **Step 3** to perform the emergency power-off.

Step 2 To perform the normal power-off, do as follows:

1. Set the power switch of the BBU to **OFF**.
2. Set the MCB on the PDU that corresponds to the BBU to **OFF**.
3. Set the MCB on the external power device that corresponds to the BBU to **OFF**.

Step 3 Set the MCB on the external power device that corresponds to the BBU to **OFF**. If time allows, set the power switch of the BBU to **OFF** , and then set the MCB on the PDU that corresponds to the BBU to **OFF**.

----End

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4 Replacing the BBU in the 19-Inch Cabinet

This chapter describes how to replace the BBU in a 19-inch cabinet, such as in an APM30 or TMC.

Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and M6 screwdriver, are ready.
- The quantity and type of BBU to be replaced are confirmed, and the new BBU is ready.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

Replacing the BBU in a 19-inch cabinet disrupts all the services carried by the base station. Therefore, the BBU should be replaced within 20 minutes.

Procedure

Step 1 Instruct the M2000 administrator to perform the following operations for the replacement of the BBU:

1. Back up the service data or transfer the service carried by the boards on the BBU to be replaced if required.
2. Modify the ESN on the BSC by referring to the new BBU. For details, see the *M2000 Operator Guide*.

Step 2 Power off the BBU. For details, see **3.2 Powering Off the BBU**.

Step 3 Wear an ESD wrist strap or a pair of ESD gloves.

WARNING

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 4 Record all the cable connections on the panels of the boards in the BBU to be replaced.

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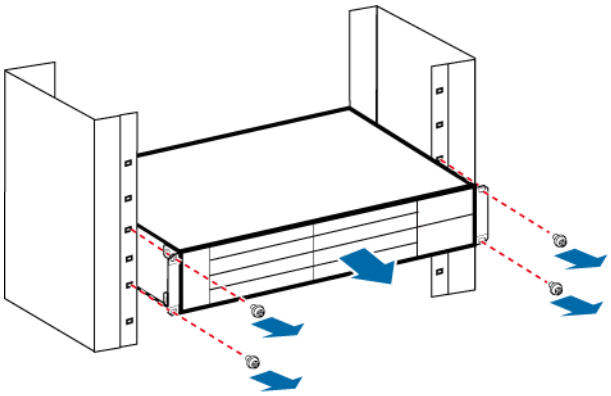
Step 5 Disconnect the power cables, transmission cables, CPRI cables, and alarm cables from the panels of the boards in the BBU.

Step 6 Loosen the four M6 screws on the BBU, and then remove the BBU, as shown in **Figure 4-1**.

Figure 4-1 Removing the BBU



Step 7 Remove all the boards in the faulty BBU, install the boards in the corresponding slots of the new BBU, and then install filler panels in the idle slots.

Step 8 Install the new BBU, tighten the screws on the BBU until the tightening torque reaches 2 N·m, and then reconnect the cables.

Step 9 Power off the BBU. For details, see **3.1 Powering On the BBU**.

Step 10 Check whether the new BBU is functional according to the status of the LEDs on the BBU. For details about the status of the LEDs, see the related hardware description.

Step 11 Inform the M2000 administrator that the replacement is complete, and then instruct the administrator to perform the following operations:

1. Check and ensure that no alarm related to the boards or modules in the BBU is generated. For details, see the related LMT User Guide.
2. Manually synchronize the inventory information. For details, see the *M2000 Operator Guide*.

Step 12 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

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5 Replacing the Components in the OMB

About This Chapter

This chapter describes how to replace the components in the OMB, such as the BBU, HEUA, AC/DC power equipment, DCDU-03B, and AC surge protection box.

5.1 Replacing the BBU
This section describes how to replace the BBU in the OMB.

5.2 Replacing the HEUA
The HEUA monitors the heat exchanger. The HEUA provides power to the FAN unit, monitors the status of the FAN unit, and collects the alarm information about the cabinet and reports the alarm to the main control unit.

5.3 Replacing the AC/DC Power Equipment
The AC/DC power equipment is used in an AC cabinet, converting external 220 V AC input power into -48 V DC power.

5.4 Replacing the DCDU-03B
The DCDU-03B distributes DC power to different components. Replacing the DCDU-03B disrupts the power supply to the entire base station and all the services carried by the base station.

5.5 Replacing the AC Surge Protection Box
The AC surge protection box provides protection for the AC input power.

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5.1 Replacing the BBU

This section describes how to replace the BBU in the OMB.

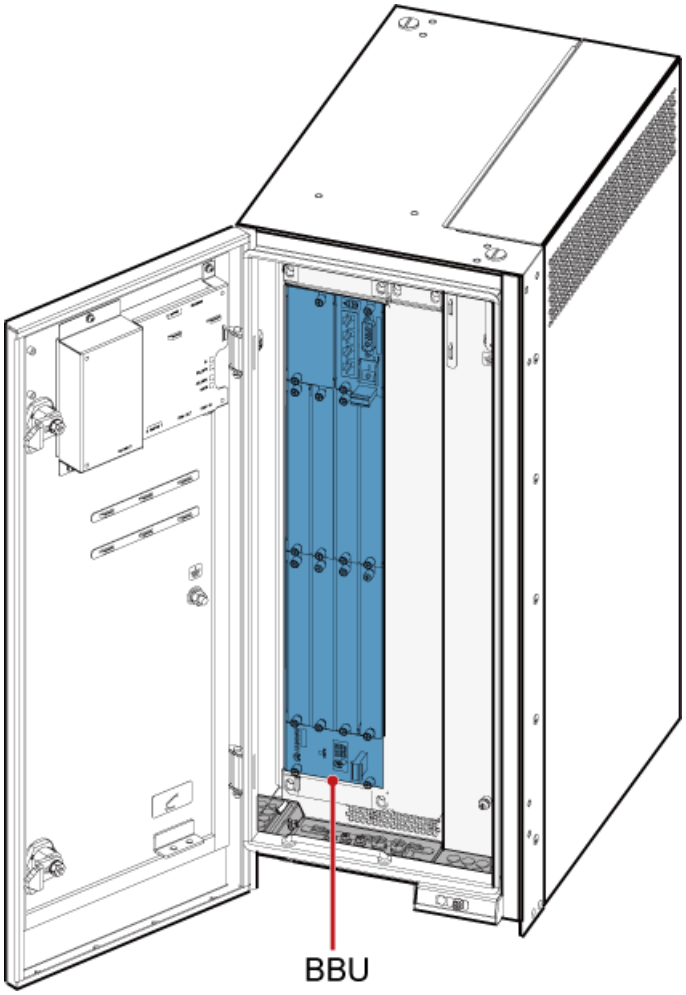
Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and M6 screwdriver, are ready.
- The quantity and type of BBU to be replaced are confirmed, and the new BBU is ready.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- Figure 5-1 shows the position of the BBU in the OMB.

Figure 5-1 Position of the BBU



- Replacing the BBU in the OMB disrupts all the services carried by the base station. Therefore, the BBU should be replaced within 20 minutes.

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Procedure

Step 1 Instruct the M2000 administrator to perform the following operations for the replacement of the BBU:

1. Back up the service data or transfer the service carried by the boards on the BBU to be replaced if required.
2. Modify the ESN on the BSC by referring to the new BBU. For details, see the *M2000 Operator Guide*.

Step 2 Power off the BBU. For details, see **3.2 Powering Off the BBU**.

Step 3 Wear an ESD wrist strap or a pair of ESD gloves.

WARNING

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 4 Record all the cable connections on the panels of the boards in the BBU to be replaced.

Step 5 Disconnect the power cables, transmission cables, CPRI cables, and alarm cables from the panels of the boards in the BBU.

Step 6 Loosen the four M6 screws on the BBU, and then remove the BBU, as shown in **Figure 5-2**.

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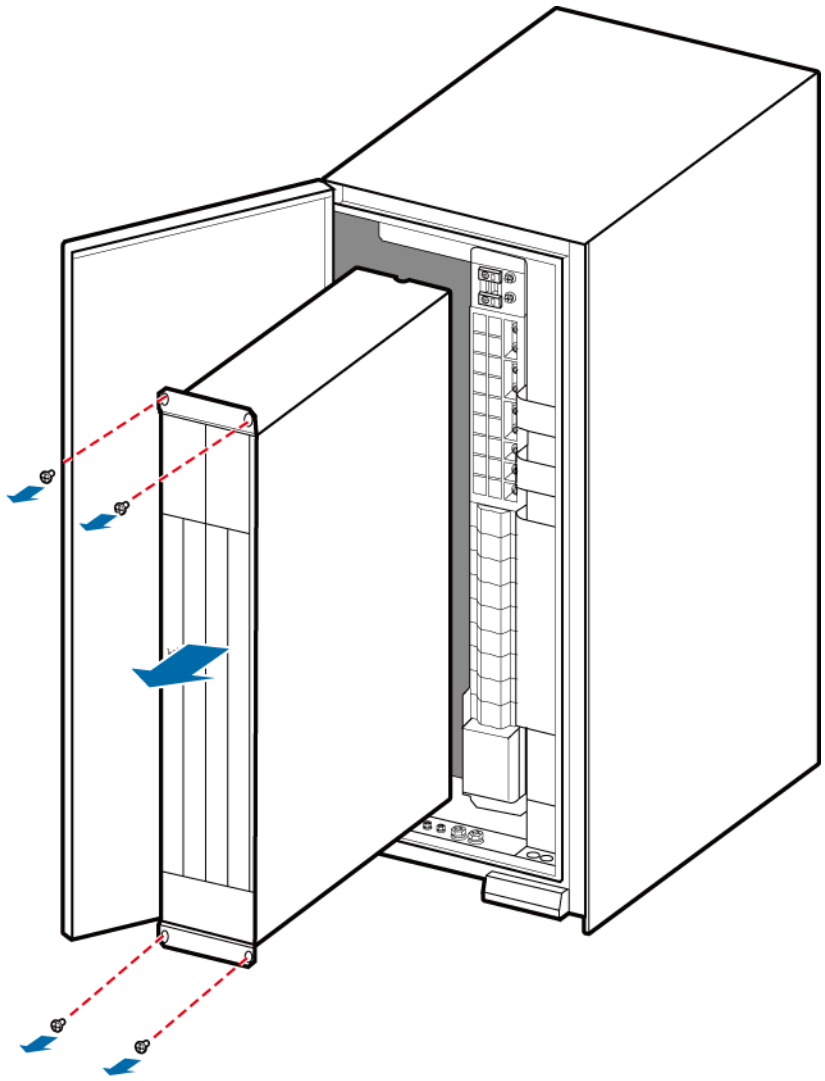
Figure 5-2 Removing the BBU



Step 7 Remove all the boards in the faulty BBU, install the boards in the corresponding slots of the new BBU, and then install filler panels in the idle slots.

Step 8 Install the new BBU, tighten the screws on the BBU until the tightening torque reaches 2 N·m, and then reconnect the cables.

Step 9 Power off the BBU. For details, see **3.1 Powering On the BBU**.

Step 10 Check whether the new BBU is functional according to the status of the LEDs on the BBU. For details about the status of the LEDs, see the related hardware description.

Step 11 Inform the M2000 administrator that the replacement is complete, and then instruct the administrator to perform the following operations:

1. Check and ensure that no alarm related to the boards or modules in the BBU is generated. For details, see the related LMT User Guide.
2. Manually synchronize the inventory information. For details, see the *M2000 Operator Guide*.

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Step 12 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

5.2 Replacing the HEUA

The HEUA monitors the heat exchanger. The HEUA provides power to the FAN unit, monitors the status of the FAN unit, and collects the alarm information about the cabinet and reports the alarm to the main control unit.

Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and M6 screwdriver, are ready.
- The quantity and type of board to be replaced are confirmed, and the new board is ready.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

Figure 5-3 shows the position of the HEUA in the OMB.

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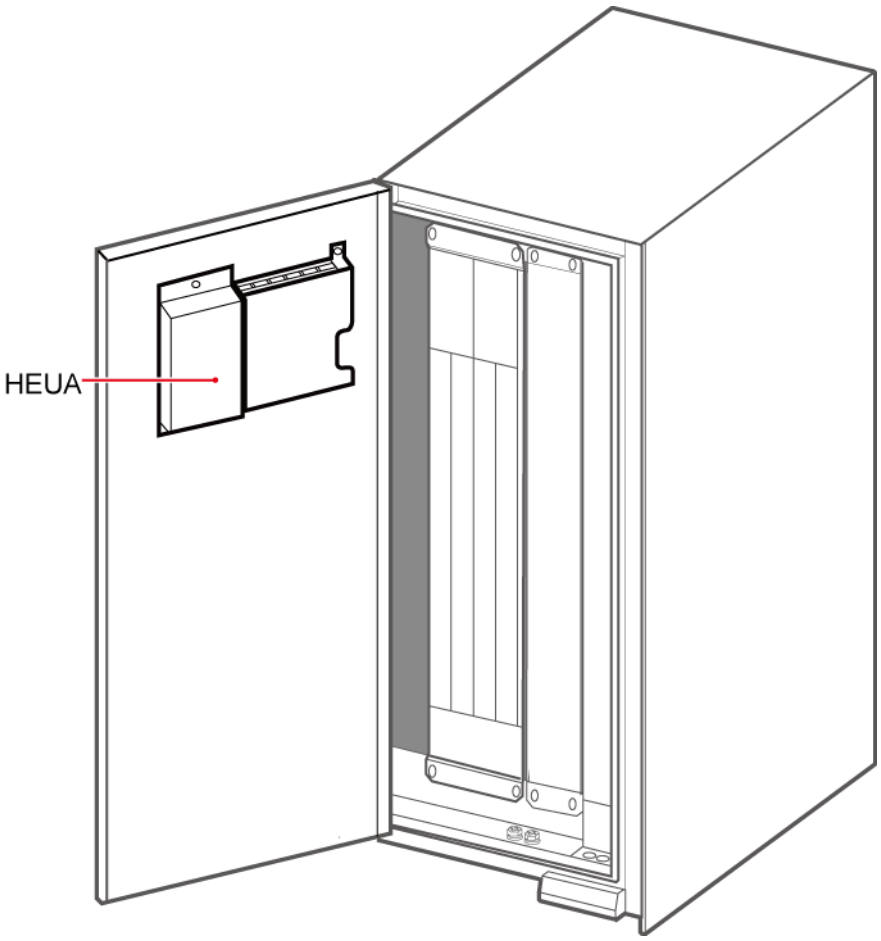
Figure 5-3 Position of the HEUA



Procedure

Step 1 Wear an ESD wrist strap or a pair of ESD gloves.

CAUTION

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 2 Set the MCB labeled SW7 on the DCDU-03B to OFF to power off the HEUA.

Step 3 Record all the cable connections on the panel of the board to be replaced.

Step 4 Disconnect the power cable and monitoring cable from the HUEA, as shown in **Figure 5-4**.

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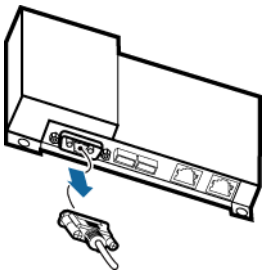
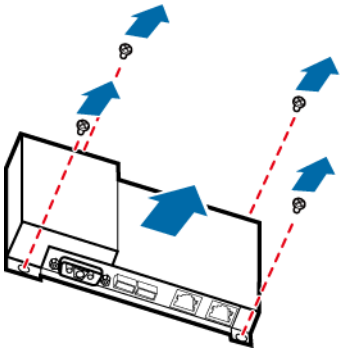
Figure 5-4 Disconnecting cables



Step 5 Unscrew the cover plate, and then unscrew the HEUA, as shown in**Figure 5-5**.

Figure 5-5 Removing the HEUA



Step 6 Install the new board, tighten the screws on the board until the tightening torque reaches 0.55 N·m, and then reconnect the cables.

Step 7 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

5.3 Replacing the AC/DC Power Equipment

The AC/DC power equipment is used in an AC cabinet, converting external 220 V AC input power into -48 V DC power.

Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves, M3 screwdriver, and M6 screwdriver, are ready.

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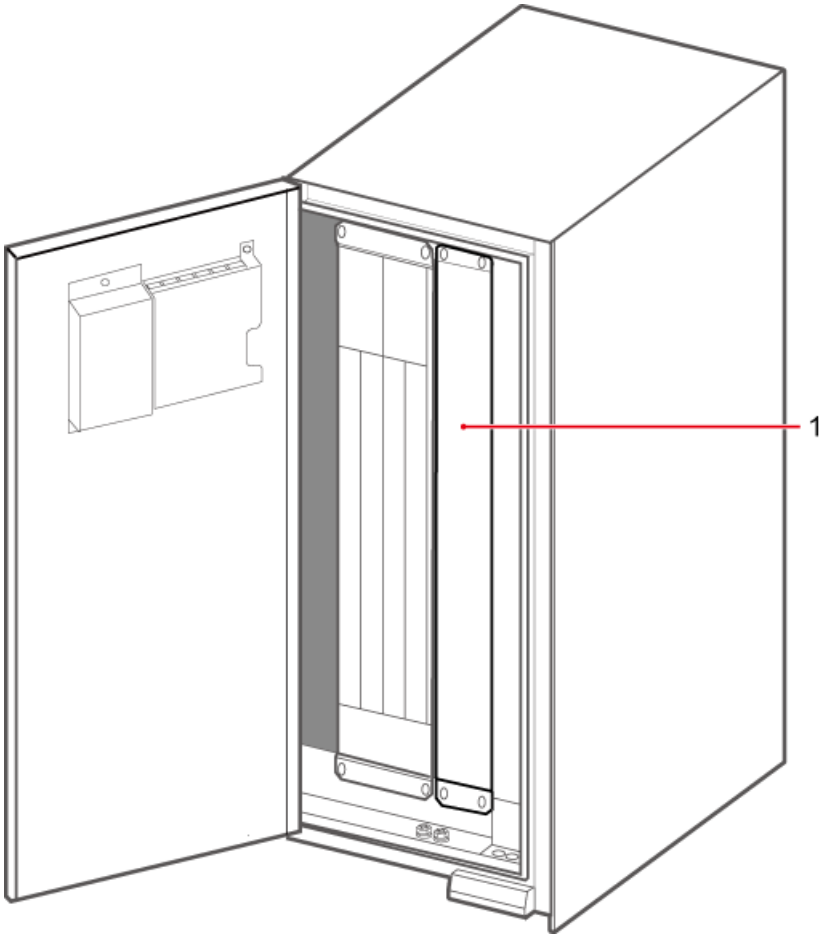
- The quantities and types of module to be replaced are confirmed, and the new modules are ready.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- The AC/DC power equipment consists of the Power Distribution Unit (PDU), Power Supply Unit (PSU), Power Monitoring Unit (PMU), and subrack. When a component of the AC/DC power equipment is faulty, you only need to replace the faulty component. When the entire AC/DC power equipment is faulty, you need to replace the AC/DC power equipment.
- **Figure 5-6** shows the position of the AC/DC power equipment in the cabinet.

Figure 5-6 Position of the AC/DC power equipment in the cabinet



(1) AC/DC power equipment

- **Figure 5-7** shows the positions of the components in the AC/DC power equipment.

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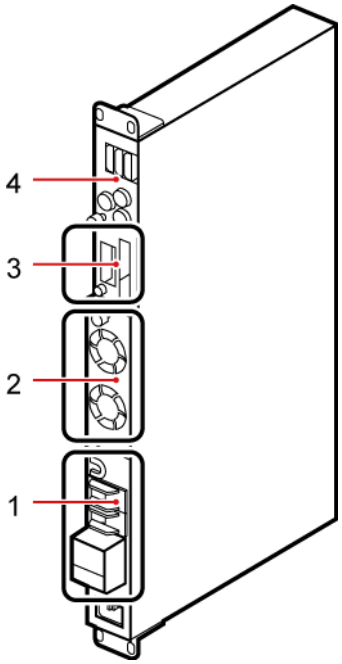
Figure 5-7 Positions of the components in the AC/DC power equipment



(1) PDU (2) PSU (3) PMU (4) Subrack

- Replacing the AC/DC power equipment, PSU, PDU, or subrack disrupts all the services carried by the base station. Therefore, the components should be replaced in 20 minutes.

Procedure

Step 1 Power off the AC/DC power equipment.

Step 2 Wear an ESD wrist strap or a pair of ESD gloves.

CAUTION

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 3 Record all the cable connections on the panel of the component to be replaced.

Step 4 Disconnect the cables.

1. Disconnect the DC output power cable from the PDU, as shown in **Figure 5-8**.

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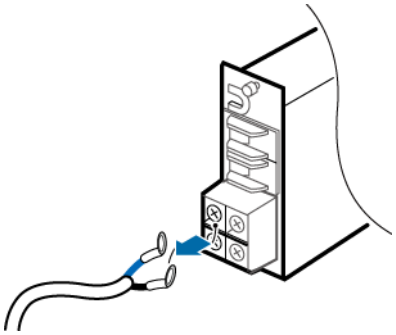
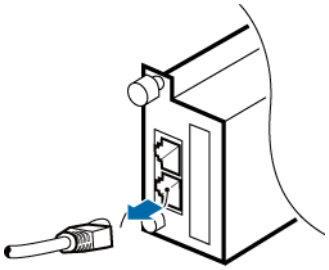
Figure 5-8 Disconnecting the cable from the PDU



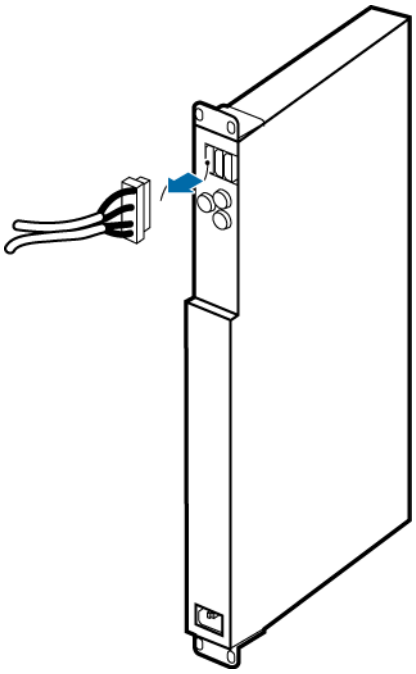
2. Disconnect the monitoring signal cable from the PMU, as shown in **Figure 5-9**.

Figure 5-9 Disconnecting the cable from the PMU



3. Disconnect the AC input power cable and DC output power cable from the subrack, as shown in **Figure 5-10**.

Figure 5-10 Disconnecting the cables from the subrack



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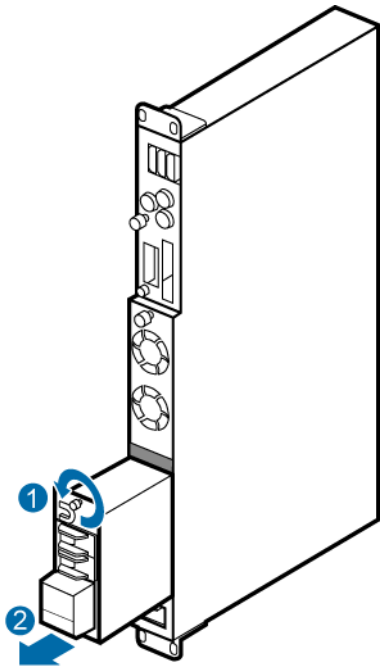
Step 5 Remove the component to be replaced.

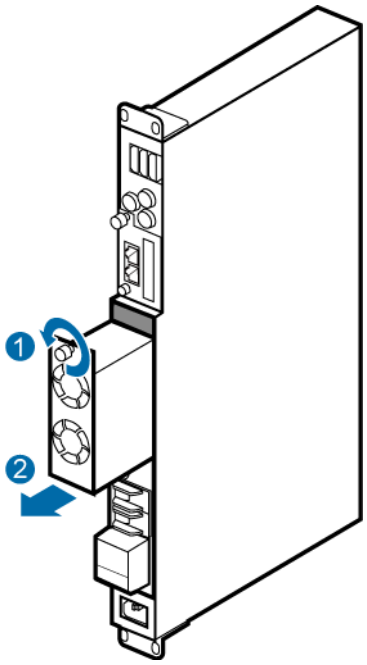
1. Loosen the M3 screw on the panel of the PDU, and then remove the PDU, as shown in Figure 5-11.

Figure 5-11 Removing the PDU



2. Loosen the M3 screw on the panel of the PSU, and then remove the PSU, as shown in Figure 5-12.

Figure 5-12 Removing the PSU



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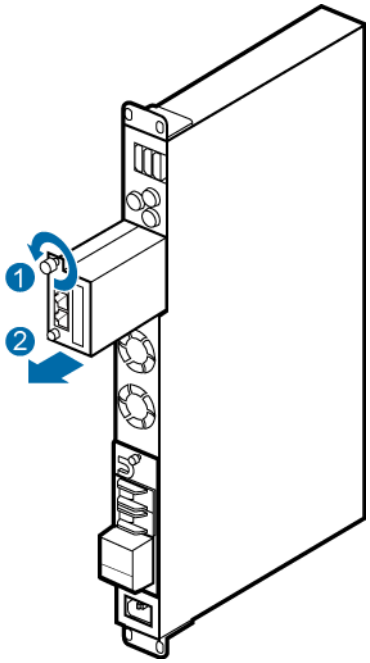
3. Loosen the M3 screw on the panel of the PMU, and then remove the PMU, as shown in **Figure 5-13**.

Figure 5-13 Removing the PMU



4. Loosen the four M6 screws on the mounting ears of the subrack, and then remove the subrack, as shown in **Figure 5-14**.

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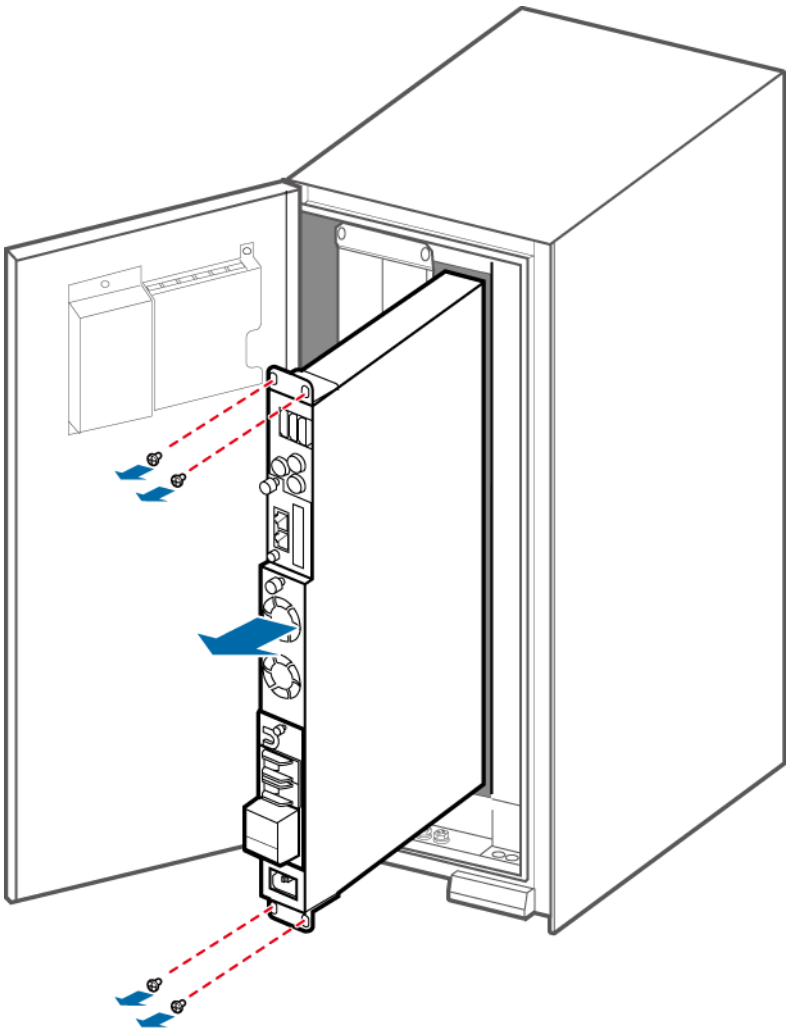
Figure 5-14 Removing the subrack



NOTE

- If you have confirmed that the subrack is faulty and needs to be replaced, you must remove the PDU, PSU, and PMU before removing the subrack from the cabinet.
- If you have confirmed that the entire AC/DC power equipment is faulty, you only need to remove the AC/DC power equipment from the cabinet.

Step 6 If the PMU needs to be replaced, set the DIP switch on the new PMU according to the settings of the DIP switch on the faulty PMU. If required, query the information about the DIP switch by referring to AC/DC Power Equipment.

Step 7 Install the new component.

1. Install the AC/DC power equipment or subrack, tighten the screws on the mounting ears until the tightening torque reaches 2 N·m, and then install related cables.
2. Install the PDU, PSU, or PMU, tighten the screws on the panel until the tightening torque reaches 0.55 N·m, and then install related cables.

Step 8 Check whether the AC/DC power equipment works properly according to the status of the LEDs on the AC/DC power equipment, BBU, and RRU.

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NOTE

For details about the status of the LEDs on the AC/DC power equipment, BBU, and RRU, see the corresponding hardware description document.

Step 9 Power on the AC/DC power equipment.

Step 10 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

5.4 Replacing the DCDU-03B

The DCDU-03B distributes DC power to different components. Replacing the DCDU-03B disrupts the power supply to the entire base station and all the services carried by the base station.

Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and M6 screwdriver, are ready.
- The quantity and type of module to be replaced are confirmed, and the new modules is ready.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- **Figure 5-15** shows the position of the DCDU-03 in the OMB.

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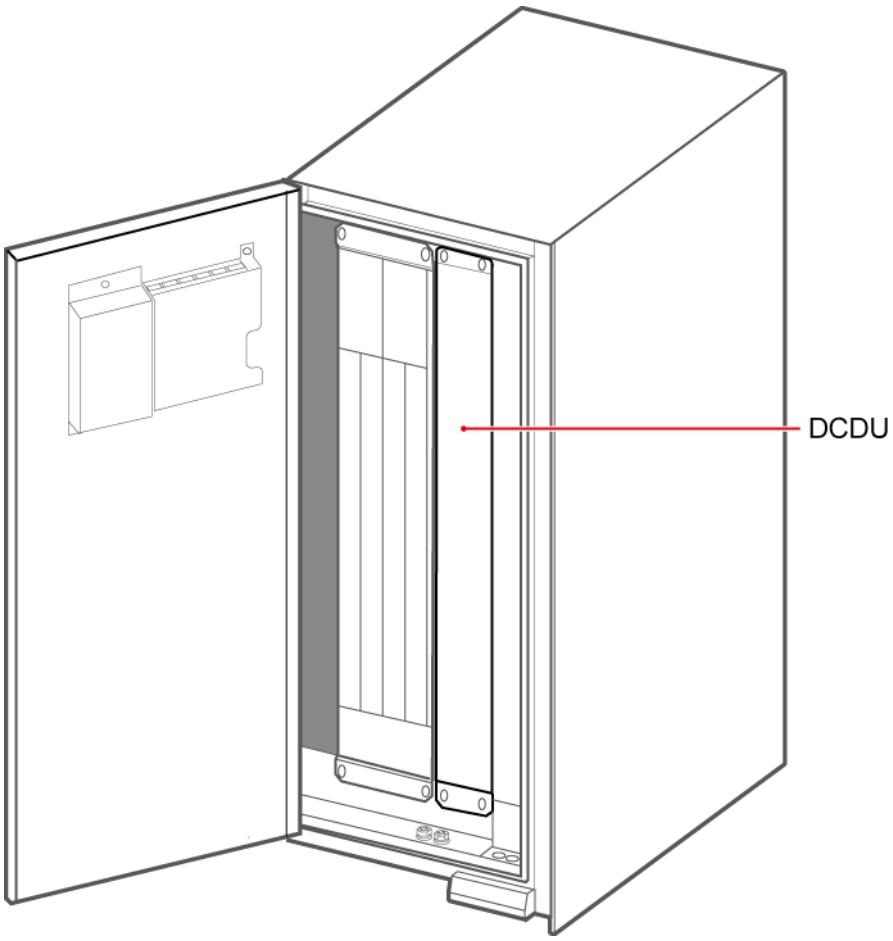
Figure 5-15 Position of the DCDU-03B



- Replacing the DCDU-03B disrupts all the services carried by the base station. Therefore, the DCDU-03B should be replaced within 20 minutes.

Procedure

Step 1 Power off the DCDU-03B.

Step 2 Wear an ESD wrist strap or a pair of ESD gloves.

CAUTION

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 3 Record all the cable connections on the panel of the board to be replaced.

Step 4 Disconnect the power cables from the DCDU-03B, as shown in **Figure 5-16**.

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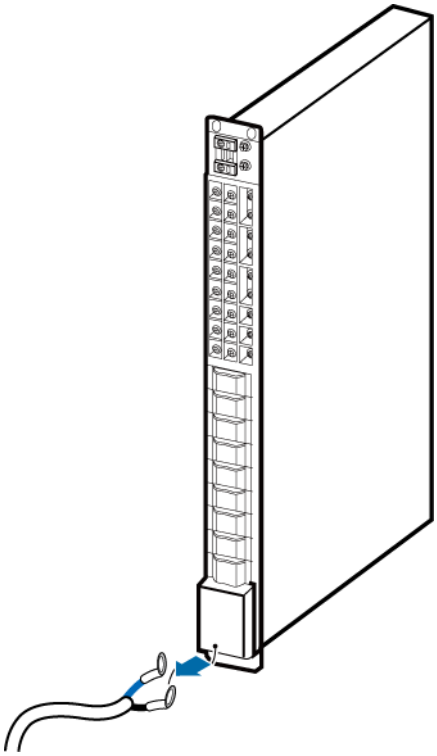
Figure 5-16 Disconnecting cables



Step 5 Loosen the four M6 screws on the panel, and then remove the DCDU-03B, as shown in **Figure 5-17**.

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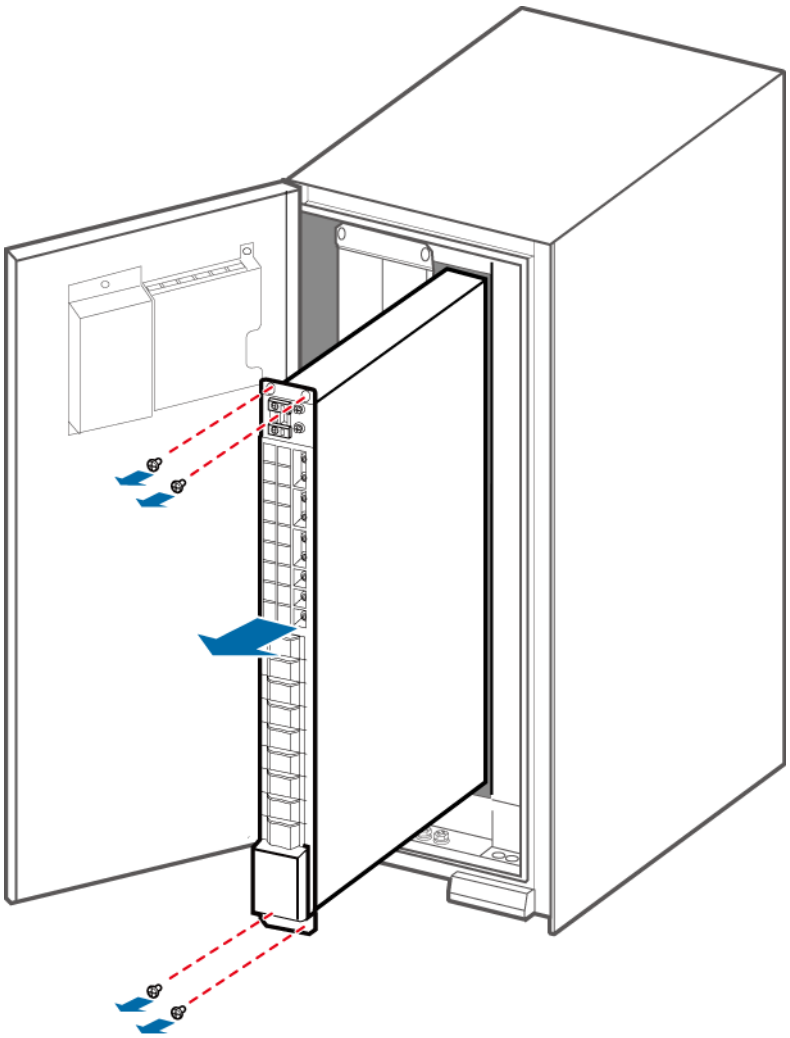
Figure 5-17 Removing the DCDU-03B



Step 6 Install the new DCDU-03B, tighten the screws on the DCDU-03B until the tightening torque reaches 2 N·m, and then reconnect the cables.

Step 7 Power on the DCDU-03B.

Step 8 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

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5.5 Replacing the AC Surge Protection Box

The AC surge protection box provides protection for the AC input power.

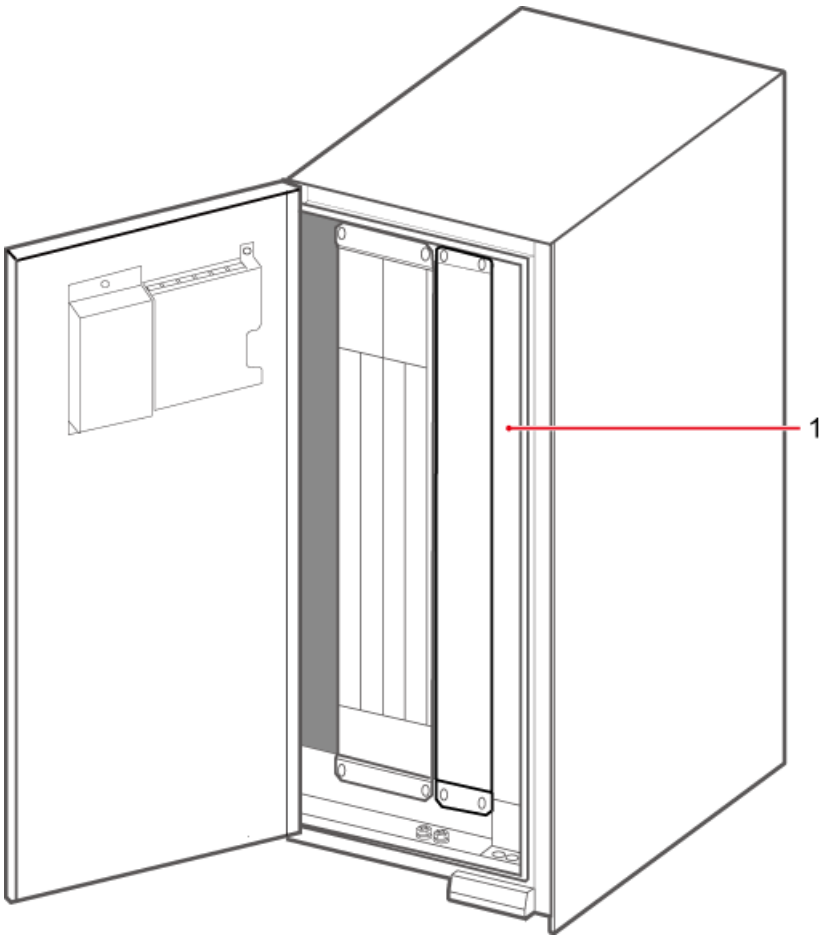
Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and M4 screwdriver, are ready.
- The quantity and type of AC surge protection box to be replaced are confirmed, and the new AC surge protection box is ready.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- Figure 5-18 shows the position of the AC surge protection box in the OMB.

Figure 5-18 Position of the AC surge protection box



(1) AC surge protection box

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- Replacing the AC surge protection box disrupts the surge protection function of the base station. Therefore, the AC surge protection box should be replaced in 10 minutes.

Procedure

Step 1 Power off the base station.

Step 2 Wear an ESD wrist strap or a pair of ESD gloves.

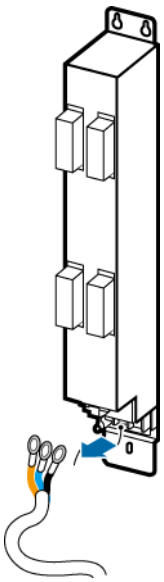
CAUTION

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 3 Record all the cable connections on the panel of the AC surge protection box to be replaced.

Step 4 Disconnect the power cable and monitoring cable from the AC surge protection box, as shown in **Figure 5-19**.

Figure 5-19 Disconnecting cables



Step 5 Loosen the M4 screw on the panel, and then remove the AC surge protection box, as shown in **Figure 5-20**.

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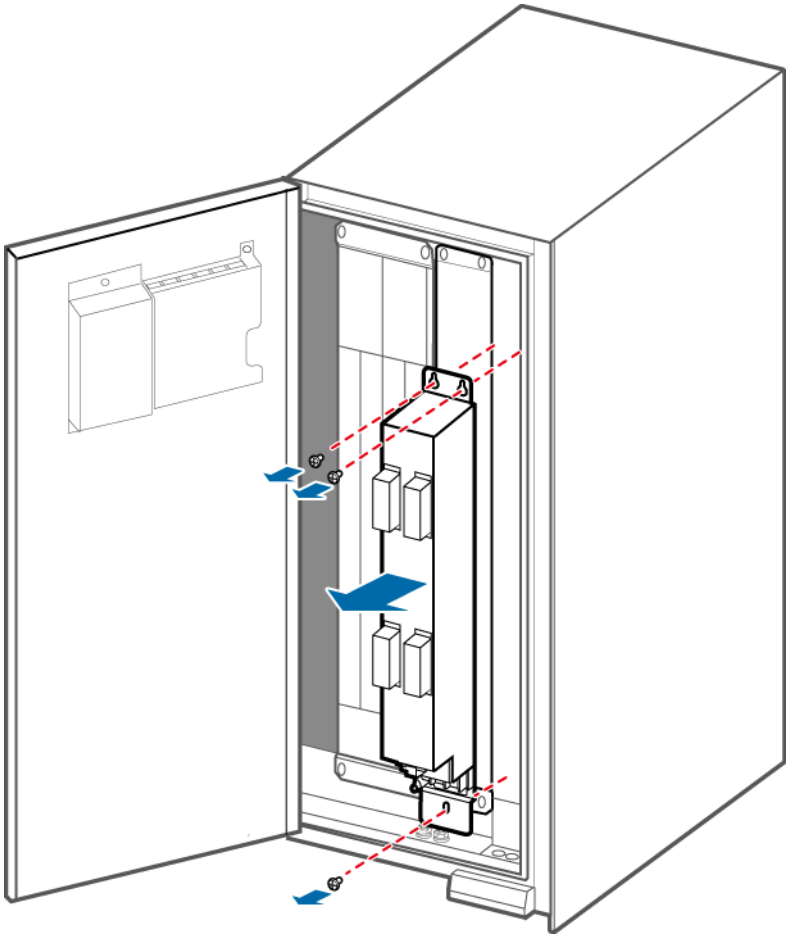
Figure 5-20 Removing the AC Surge Protection Box



Step 6 Install the new AC surge protection box, tighten the screw on the panel until the tightening torque reaches 1.2 N·m, and then reconnect the cables.

Step 7 Power on the base station.

Step 8 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

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6 Replacing the BBU Parts

About This Chapter

When BBU3900 components are faulty, they need to be replaced as soon as possible. The components that can be replaced are the BBU3900, boards and modules of the BBU3900, and optical modules.

6.1 Querying Board Information
Before replacing a board, you need to query the board information at the remote end to confirm the type of board to be replaced.

6.2 Replacing the GTMU
The GSM Transmission & Management Unit for BBU (GTMU) is the basic transmission and control function entity of the BBU. It provides the reference clock, power supply port, maintenance port, and external alarm collection port, and controls and manages the entire base station.

6.3 Replacing the UPEU
This describes the Universal Power and Environment Interface Unit (UPEU) board. It is a mandatory board of the BBU that converts -48 V or +24 V DC to +12 V DC.

6.4 Replacing the UEIU
The Universal Environment Interface Unit (UEIU) provides channels for transmitting the monitoring signals from the service board to the BBU.

6.5 Replacing the FAN Unit
The FAN unit is located in the BBU. The unit and the air inlet box form a ventilation loop, which ensures ventilation and heat dissipation. Replacing the FAN unit may lead to overtemperature alarms due to interruption of heat dissipation in the BBU. The services, however, are not affected.

6.6 Replacing the USCU
The Universal Satellite card and Clock Unit (USCU) in the BBU receives clock signals such as the GPS, RGPS, BITS, and M-1PPS signals. In addition, it transmits or receives 1PPS+TOD clock signals.

6.7 Replacing the Optical Module
The optical module implements optical-electrical conversion, thus enabling optical transmission between the BBU and other devices.

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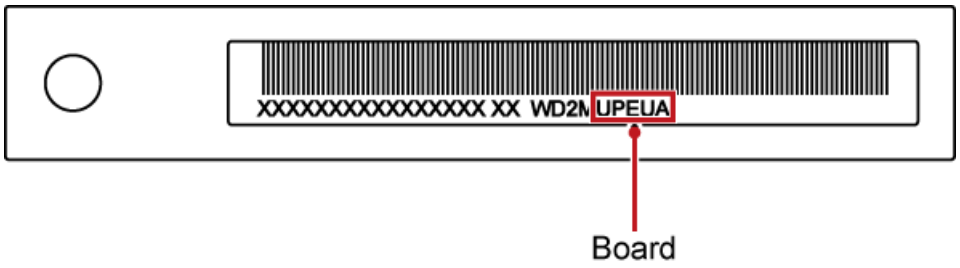
6.1 Querying Board Information

Before replacing a board, you need to query the board information at the remote end to confirm the type of board to be replaced.

1. Run the **DSP BTSELABEL** command on the LMT.
2. Confirm the type of the board to be replaced according to the **Boadtype** and **Description** fields in the query result. Ensure that the new board is of the same type by checking the information indicated by the bar code on the label of the panel or handle of the new board. **Figure 6-1** shows a label containing the bar code.

Figure 6-1 A label containing the bar code



6.2 Replacing the GTMU

The GSM Transmission & Management Unit for BBU (GTMU) is the basic transmission and control function entity of the BBU. It provides the reference clock, power supply port, maintenance port, and external alarm collection port, and controls and manages the entire base station.

Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and M3 screwdriver, are ready.
- The quantity and type of board to be replaced are confirmed. For details, see **6.1 Querying Board Information**.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- **Figure 6-2** shows the position of the GTMU in the BBU.

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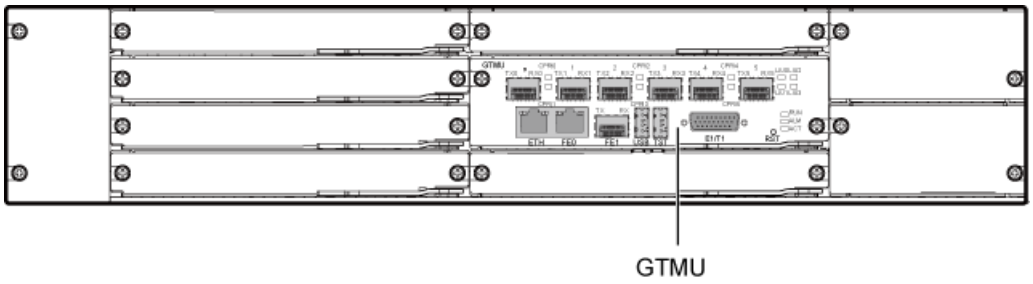
Figure 6-2 Position of the GTMU



- The board is hot-swappable.
- Replacing the GTMU disrupts all the services carried by the GSM base station. Therefore, the GTMU should be replaced within 20 minutes.

Procedure

Step 1 Instruct the M2000 administrator to perform the following preparations for the replacement of the GTMU:

1. Back up the service data or transfer the service carried by the component to be replaced if required.
2. Run the **BLK CELL** command to block all the cells in the base station.

Step 2 Wear an ESD wrist strap or a pair of ESD gloves.

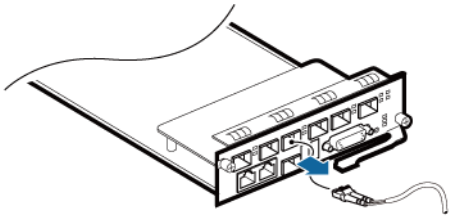
CAUTION

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 3 Record all the cable connections on the panel of the board to be replaced.

Step 4 Disconnect the transmission cable and CPRI cable from the GTMU. If a surge protection board is configured, the surge protection transfer cable also needs to be disconnected, as shown in **Figure 6-3**.

Figure 6-3 Disconnecting cables



Step 5 Remove the two M3 screws on the panel, and then remove the GTMU, as shown in **Figure 6-4**.

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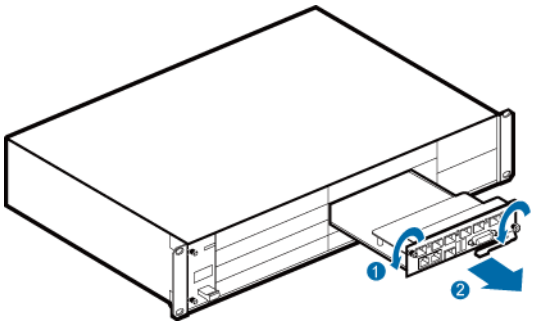
Figure 6-4 Removing the GTMU



Step 6 Set the DIP switch on the new board according to the settings of the DIP switch on the faulty board. If required, query the information about the DIP switch by referring to GTMU.

Step 7 Install the new board, tighten the screws on the board until the tightening torque reaches 0.6 N·m, and then reconnect the cables.

Step 8 Check whether the new board is functional according to the status of the LEDs on the board. For details about the status of the LEDs, see GTMU.

Step 9 Inform the M2000 administrator that the replacement is complete, and then instruct the administrator to perform the following operations:

1. Query the software version of the board. For details, see the related LMT User Guide. If the software version is the target version, go to **Step 9.3**. If not, go to **Step 9.2**.
2. On the LMT, run the **LST BTSAUTODLDACTINFO** command to query whether automatic load and activation of the BTS software version is enabled on the BSC. If not, load and activate the software versions of the GTMU and TRXs of the corresponding base station. If yes, go to **Step 9.3**.
3. Run the **UBL CELL** command to unblock all the cells in the base station.
4. Check and ensure that no alarm related to the board is generated. For details, see the related LMT User Guide.
5. Manually synchronize the inventory information. For details, see the *M2000 Operator Guide*.

Step 10 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

6.3 Replacing the UPEU

This describes the Universal Power and Environment Interface Unit (UPEU) board. It is a mandatory board of the BBU that converts -48 V or +24 V DC to +12 V DC.

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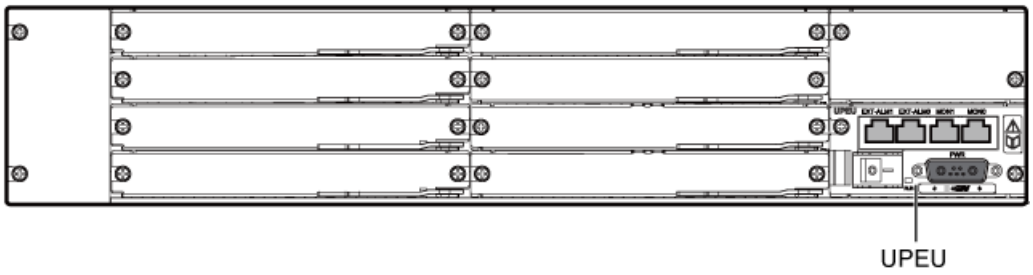
Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and M3 screwdriver, are ready.
- The quantity and type of board to be replaced are confirmed. For details, see **6.1 Querying Board Information**.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- **Figure 6-5** shows the position of the UPEU in the BBU.

Figure 6-5 Position of the UPEU



- Replacing the UPEU disrupts the power supply to the BBU, and the services are also disrupted. Therefore, the UPEU should be replaced within 10 minutes.

Procedure

Step 1 Instruct the M2000 administrator to perform the following operations for the replacement of the UPEU:

1. Back up the service data or transfer the service carried by the component to be replaced if required.
2. Run the **BLK CELL** command to block all the cells in the base station.

CAUTION

Replacing the UPEU disrupts all the services carried by the base station if no standby UPEU is configured.

Step 2 Power off the BBU. For details, see Powering Off the BBU3900.

Step 3 Wear an ESD wrist strap or a pair of ESD gloves.

WARNING

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

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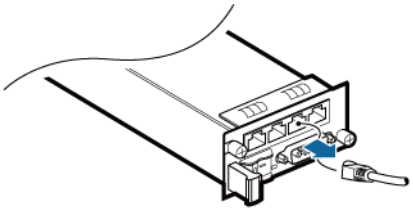
Step 4 Record all the cable connections on the panel of the board to be replaced.

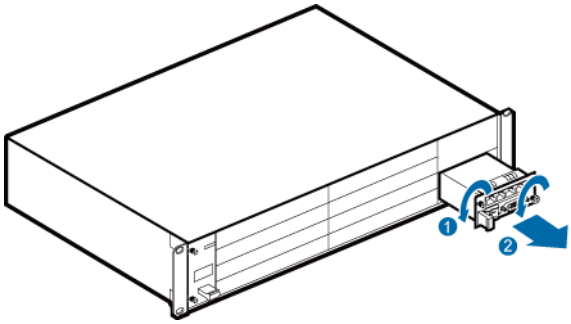
Step 5 Disconnect the power cable, monitoring cable and alarm cable on the UPEU. as shown in **Figure 6-6**.

Figure 6-6 Disconnecting cables



Step 6 Remove the two M3 screws on the panel, and then remove the UPEU, as shown in **Figure 6-7**.

Figure 6-7 Removing the UPEU



Step 7 Install the new board, tighten the screws on the board until the tightening torque reaches 0.6 N·m, and then reconnect the cables.

Step 8 Power on the BBU. For details, see Powering on the BBU3900.

Step 9 Check whether the new board is functional according to the status of the LEDs on the board. For details about the status of the LEDs, see UPEU.

Step 10 Inform the M2000 administrator that the replacement is complete, and then instruct the administrator to perform the following operations:

1. Load and activate the software version of the UPEU. For details, see the related LMT User Guide.
2. Run the **UBL CELL** command to unblock all the cells in the base station.
3. Check and ensure that no alarm related to the board is generated. For details, see the related LMT User Guide.
4. Manually synchronize the inventory information. For details, see the *M2000 Operator Guide*.

Step 11 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

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Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced board.
- Contact the local Huawei office to handle the faulty board.

6.4 Replacing the UEIU

The Universal Environment Interface Unit (UEIU) provides channels for transmitting the monitoring signals from the service board to the BBU.

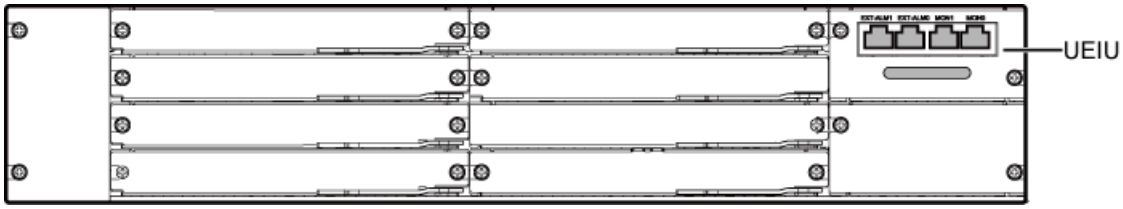
Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and M3 screwdriver, are ready.
- The quantity and type of board to be replaced are confirmed. For details, see **6.1 Querying Board Information**.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- **Figure 6-8** shows the position of the UEIU in the BBU.

Figure 6-8 Position of the UEIU



- The board is hot-swappable.
- Replacing the UEIU disrupts the monitoring of the external equipment. Therefore, the UEIU should be replaced within five minutes.

Procedure

Step 1 Wear an ESD wrist strap or a pair of ESD gloves.

WARNING

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 2 Record all the cable connections on the panel of the board to be replaced.

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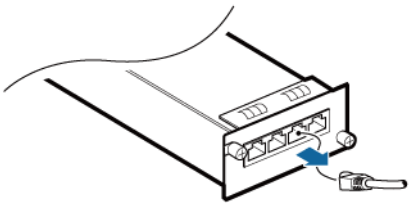
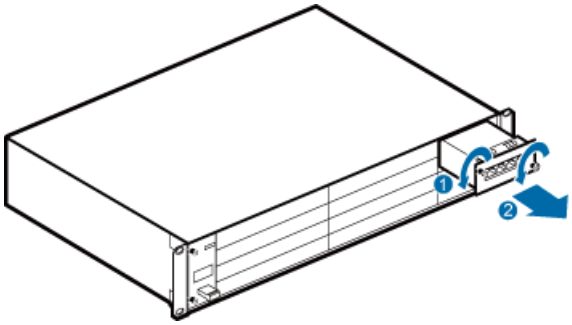
Step 3 Disconnect the monitoring cable and alarm cable from the UEIU, as shown in **Figure 6-9**.

Figure 6-9 Disconnecting cables



Step 4 Remove the two M3 screws on the panel, and then remove the UEIU, as shown in **Figure 6-10**.

Figure 6-10 Removing the UEIU



Step 5 Install the new board, tighten the screws on the board until the tightening torque reaches 0.6 N·m, and then reconnect the cables.

Step 6 Inform the M2000 administrator that the replacement is complete, and then instruct the administrator to perform the following operations:

1. Check and ensure that no alarm related to the board is generated. For details, see the related LMT User Guide.
2. Manually synchronize the inventory information. For details, see the *M2000 Operator Guide*.

Step 7 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

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6.5 Replacing the FAN Unit

The FAN unit is located in the BBU. The unit and the air inlet box form a ventilation loop, which ensures ventilation and heat dissipation. Replacing the FAN unit may lead to overtemperature alarms due to interruption of heat dissipation in the BBU. The services, however, are not affected.

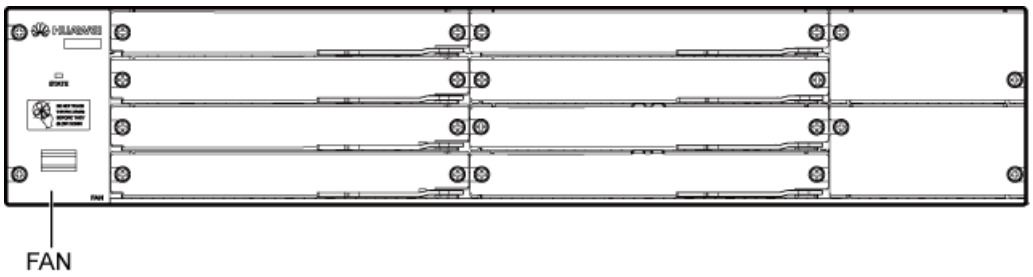
Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and M3 screwdriver, are ready.
- The quantity and type of board to be replaced are confirmed. For details, see **6.1 Querying Board Information**.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- **Figure 6-11** shows the position of the FAN unit in the BBU.

Figure 6-11 Position of the FAN unit



- The unit is hot-swappable.
- Replacing the FAN unit may lead to overtemperature alarms due to interruption of heat dissipation in the BBU. Therefore, the FAN unit should be replaced within three minutes.

Procedure

Step 1 Wear an ESD wrist strap or a pair of ESD gloves.

WARNING

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 2 Remove the two M3 screws on the panel, and then remove the FAN unit, as shown in **Figure 6-12**.

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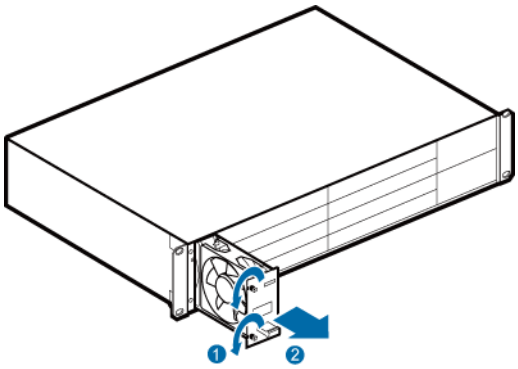
Figure 6-12 Removing the FAN unit



CAUTION

Do not touch the rotating fans to prevent damage to your hands when removing the FAN unit.

Step 3 Install the new unit, tighten the screws on the unit until the tightening torque reaches 0.6 N·m.

Step 4 Check whether the new unit is functional according to the status of the LEDs on the unit. For details about the status of the LEDs, see FAN.

Step 5 Inform the M2000 administrator that the replacement is complete, and then instruct the administrator to perform the following operations:

1. Check and ensure that no alarm related to the unit is generated. For details, see the related LMT User Guide.
2. Manually synchronize the inventory information. For details, see the *M2000 Operator Guide*.

Step 6 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

6.6 Replacing the USCU

The Universal Satellite card and Clock Unit (USCU) in the BBU receives clock signals such as the GPS, RGPS, BITS, and M-1PPS signals. In addition, it transmits or receives 1PPS+TOD clock signals.

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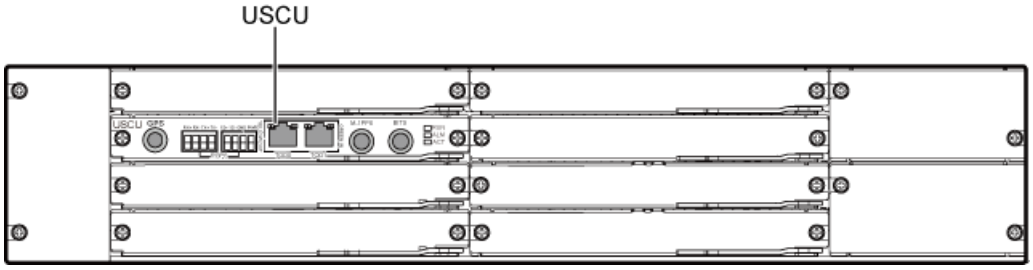
Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and screwdriver, are ready.
- The quantity and type of board to be replaced are confirmed. For details, see **6.1 Querying Board Information**.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- **Figure 6-13** shows the position of the USCU in the BBU.

Figure 6-13 Position of the USCU



- The board is hot-swappable.

Procedure

Step 1 Wear an ESD wrist strap or a pair of ESD gloves.

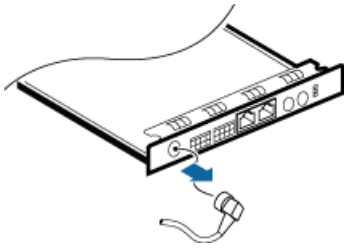
WARNING

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 2 Record all the cable connections on the panel of the board to be replaced.

Step 3 Disconnect the GPS clock signal cable from the USCU, as shown in **Figure 6-14**.

Figure 6-14 Disconnecting cables



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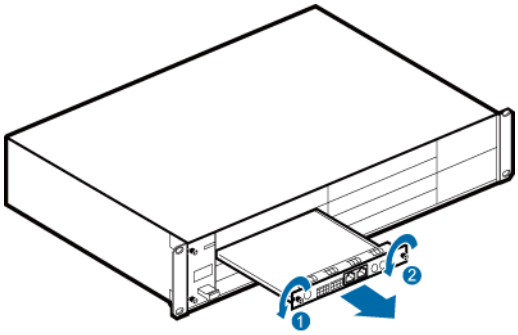
Step 4 Remove the two M3 screws on the panel, and then remove the USCU, as shown in **Figure 6-15**.

Figure 6-15 Removing the USCU



Step 5 Install the new board, tighten the screws on the board until the tightening torque reaches 0.6 N·m, and then reconnect the cables.

Step 6 Check whether the new board is functional according to the status of the LEDs on the board. For details about the status of the LEDs, see USCU.

Step 7 Inform the M2000 administrator that the replacement is complete, and then instruct the administrator to perform the following operations:

1. Load and activate the software version of the USCU. For details, see the related LMT User Guide.
2. Check and ensure that no alarm related to the board is generated. For details, see the related LMT User Guide.
3. Manually synchronize the inventory information. For details, see the *M2000 Operator Guide*.

Step 8 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

6.7 Replacing the Optical Module

The optical module implements optical-electrical conversion, thus enabling optical transmission between the BBU and other devices.

Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves, are ready.

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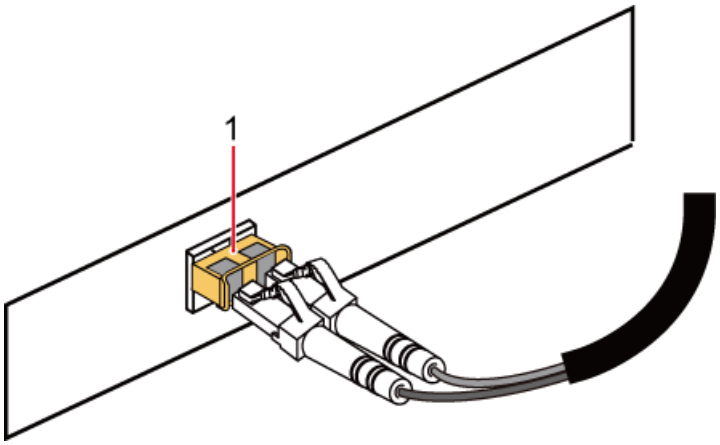
- All the types of optical module are ready.
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- **Figure 6-16** shows the position of the optical module on a board.

Figure 6-16 Position of the optical module



(1) Optical module

- The optical module is hot-swappable.

Procedure

Step 1 Wear an ESD wrist strap or a pair of ESD gloves.

CAUTION

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 2 Choose the optical module of the same type as the faulty optical module according to the label on the module.

Step 3 Record the position of the faulty optical module on the board.

Step 4 Press the latch on the optical cable connector, and then remove the connector from the faulty optical module, as shown in **Figure 6-17**.

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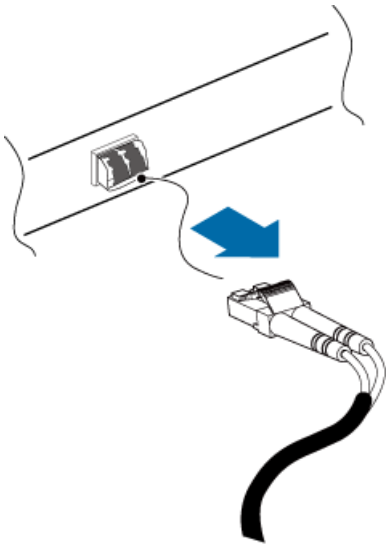
Figure 6-17 Disconnecting cables

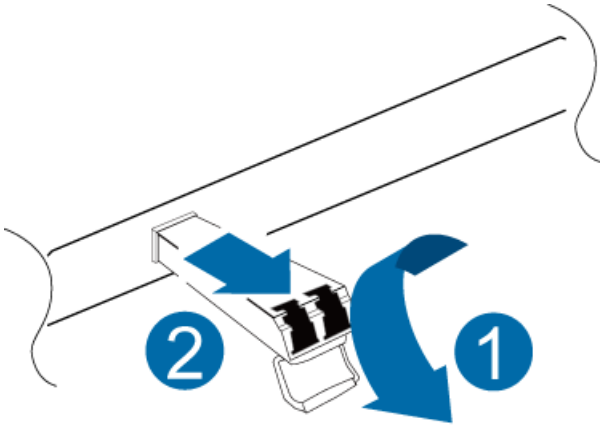


WARNING

Do not look into the optical module without eye protection after the optical cable is removed from the optical module.

Step 5 Turn the puller on the faulty optical module outwards, hold the puller and take the faulty optical module out of the slot, and then remove the optical module from the BBU, as shown in **Figure 6-18**.

Figure 6-18 Removing the optical module



Step 6 Install the new optical module onto the BBU.

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Step 7 Remove the dustproof caps from the new optical module and optical connector, and then insert the optical cable connector into the new optical module.

Step 8 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

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7 Replacing SLPU Parts

About This Chapter

During the SLPU maintenance, the following parts of the SLPU can be replaced as required: the SLPU case and UELP.

7.1 Replacing the SLPU
The Signal Lightning Protection Unit (SLPU) provides surge protection for a base station.

7.2 Replacing the UELP
Each Universal E1/T1 Lightning Protection unit (UELP) provides protection for four E1s/T1s.

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7.1 Replacing the SLPU

The Signal Lightning Protection Unit (SLPU) provides surge protection for a base station.

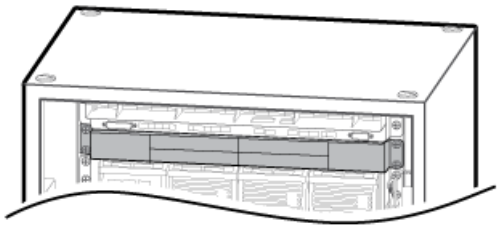
Prerequisite

- The tools and materials, such as an ESD wrist strap, a pair of ESD gloves, and a screwdriver, are ready.
- The new boards are available according to the quantity and types of the boards to be replaced. For details, see the *LMT User Guide*.
- The associated personnel are permitted to enter the site. The required keys are available.

Context

- **Figure 7-1** shows the position of the SLPU in a cabinet.

Figure 7-1 Position of the SLPU



Procedure

Step 1 Notify the administrator of the M2000 to perform the following operations preparatory to the replacement of the SLPU:

If necessary, back up or transfer the service data carried by the board.

Step 2 Wear an ESD wrist strap or a pair of ESD gloves.

WARNING

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 3 Record all the cable connections on the panel of the board to be replaced.

Step 4 Disconnect the transmission cable on the panel of the SLPU.

Step 5 Remove the four M6 screws on the panel and remove the SLPU, as shown in **Figure 7-2**.

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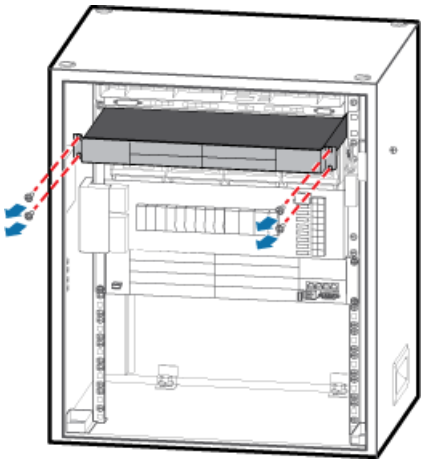
Figure 7-2 Removing the SLPU



Step 6 Remove all the boards in the faulty SLPU, install the boards in the corresponding slots of the new SLPU, and then install filler panels in the idle slots.

Step 7 Install the new SLPU, tighten the screws on the SLPU until the tightening torque reaches 2 N·m, and then reconnect the cables.

Step 8 Notify the administrator of the M2000 that the replacement is complete, and tell the administrator to perform the following operations:

1. Check and ensure that no alarm related to the board is generated. For details, see the related LMT User Guide.
2. Manually synchronize the inventory information. For details, see the *M2000 Operator Guide*.

Step 9 Take off the ESD wrist strap or gloves, and pack up the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

7.2 Replacing the UELP

Each Universal E1/T1 Lightning Protection unit (UELP) provides protection for four E1s/T1s.

Prerequisite

- The tools and materials, such as an ESD wrist strap or ESD gloves and M3 screwdriver, are ready.
- The quantity and type of board to be replaced are confirmed. For details, see **6.1 Querying Board Information**.

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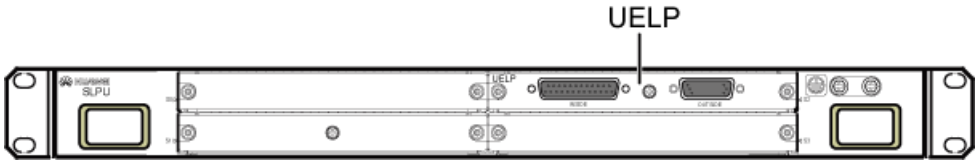
- The authorized personnel are permitted to enter the site. The required keys are available.

Context

- **Figure 7-3** shows the position of the UELP in the SLPU.

Figure 7-3 Position of the UELP



- The board is hot-swappable.

Procedure

Step 1 Instruct the M2000 administrator to perform the following preparations for the replacement of the UELP:

Back up the service data or transfer the service carried by the component to be replaced if required.

Step 2 Wear an ESD wrist strap or a pair of ESD gloves.

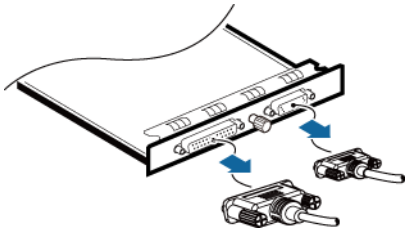
CAUTION

Take proper ESD protection measures, for example, wear an ESD wrist strap or a pair of ESD gloves, to prevent electrostatic damage to the boards, modules, or electronic components.

Step 3 Record all the cable connections on the panel of the board to be replaced.

Step 4 Disconnect the transmission cables from the UELP, as shown in **Figure 7-4**.

Figure 7-4 Disconnecting cables



Step 5 Remove the four M3 screws on the panel, and then remove the UELP, as shown in **Figure 7-5**.

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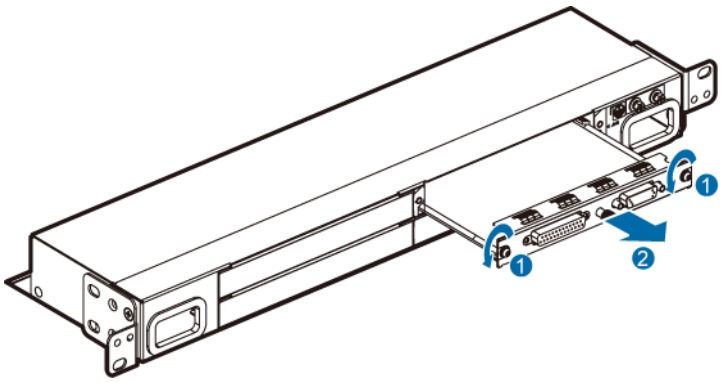
Figure 7-5 Removing the UELP



Step 6 Set the DIP switch on the new board according to the settings of the DIP switch on the faulty board. If required, query the information about the DIP switch by referring to UELP.

Step 7 Install the new board, tighten the screws on the board until the tightening torque reaches 0.6 N·m, and then reconnect the cables.

Step 8 Inform the M2000 administrator that the replacement is complete, and then instruct the administrator to perform the following operations:

1. Load and activate the software version of the UELP. For details, see the *LMT User Guide*.
2. Manually synchronize the inventory information. For details, see the *M2000 Operator Guide*.

Step 9 Take off the ESD wrist strap or gloves, and then pack up all the tools.

----End

Follow-up Procedure

- Place the replaced component into the ESD box or bag. Then, place the ESD box or bag into a carton padded with foam or into the packing box of the new component.
- Fill in the fault form with the details of the replaced component.
- Contact the local Huawei office to handle the faulty component.

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